

however, which we recognize as dependent on the sensory fibres, are those which we know to be the cause of reflex movements. The above experiments, therefore, would lead to the conclusion, that tetanus caused by strychnine arises entirely from general reflex movements, and that the action of the strychnine not only excites the motor fibres, but goes to increase the necessary cause from which reflex movements arise. If this be true, tetanus must cease, even when the spinal marrow is uninjured, provided the conditions under which reflex movements arise are removed. In order to test this, the following experiments were instituted:—

Exp. XI. The skin of a frog was rubbed over with strong prussic acid (30 per cent.), so that the superficial peripheral extremities of the nerves were paralyzed. Strychnine was exhibited; no tetanus ensued, except when the animal was strongly shaken (thrown about, for example).

Exp. XII. After laying open the spine of a frog, the posterior nervous roots were divided. Same result as above, or as when the posterior column of the cord was irritated with a needle.

Exp. XIII. The same experiment was repeated in a frog in which tetanus was present; it ceased immediately on division of the posterior roots, and only recurred under the conditions first stated.

From these experiments, then, it may be concluded, that tetanus arising from the action of strychnine originates entirely and alone from reflex movements produced by the strychnine, exciting to increased action the primary cause of the reflex motions themselves.

The next question that occurs is, what is the primary cause of these reflex movements? Here, however, we find ourselves in the field of physiological controversy; as far as regards the question first considered, it is a matter of little moment how the controversy may be decided. It may be remarked, however, that tetanus induced by strychnine, cannot be attributed to a general increased excitement of the nervous system. Were this the case, stronger contractions of the muscles dependent on the anterior cord laid bare in Exp. VIII., IX. and X., should have occurred rather before the administration of the poison than after it; but this was not the case. Other experiments, which require to be repeated, however, seem to show that the cause of reflex motion is to be sought for in the gray matter of the spinal cord; that the strychnine acts, therefore, by exciting to activity this gray matter, or rather the ganglionic in masses composed of it. These experiments are the following:—

Exp. XIV. A needle was carefully passed down through the centre of the spinal marrow, of a beheaded frog, as far as the point where the nerves to the anterior extremities are given off, and then withdrawn. Strychnine was then administered. Tetanus occurred in the posterior extremities only.

Exp. XV. After laying open the spinal canal, the gray matter of the posterior half of the cord was destroyed as far as it gave off nerves to the posterior extremities. The movements of the latter were little affected by the operation; but tetanus did not ensue after the exhibition of strychnine.—*Month. Journ. Med. Sci.*, Aug., 1847., from *Zeitschrift für Rationelle Med.*, Bd. V. lt. 2.

3. *On the Nerves of the Sheaths of the Roots of Spinal Nerves.*—M. PAPPENHEIM addressed a note to the Academy of Sciences, which was read at their sitting on the 13th of August, respecting the sheaths of the roots of spinal nerves, and the necessity of taking into consideration the existence of their small nerves in drawing conclusions from any experiments on recurrent sensibility. The author stated that he had rendered himself certain of the existence, both in the horse and dog, of small nerves on the sheaths of the anterior roots of the spinal nerves, a matter which had been doubted by some anatomists. From numberless observations on all parts of the human body, he had become persuaded that nerves would be found wherever arteries were met with. "Now, on the anterior roots of a spinal nerve, an artery is found; at its side are nerves, but their number, structure, origin, and situation, are not always the same. I find, too, as does M. Magendie, that the inferior nerves, on the anterior roots of which sensibility has so clearly been observed, have the greatest number of nerve-fibres in their sheaths, whilst the superior roots, of short extent, are so poorly provided with nerves, that sometimes I have failed to find any, but which at present appears a matter of little moment.

The nerves of the sheaths do not wholly belong to the system of vegetable life, (the organic nervous system,) but also, in part, to the cerebro-spinal system. The fact is completely beyond dispute, for I have two or three times succeeded in following nerves clearly arising from the root, and curving upwards, to arrive at the sheath of the motor nerves. Sometimes the nerves, having gained the sheath, proceed upwards; sometimes they descend; sometimes they may be followed to the inside of the dura mater; at other times they remain outside of it. In most cases I have succeeded in finding but one ramification of the nerves; once I have seen a nerve-filament, consisting of nearly eight or ten primitive fibres, mount and divide into two portions, one of which continued its course, whilst the other descended towards the periphery, forming an arch, such as is observed to be the termination of nerves, in numerous cases."—*Prov. Med. and Surg. Journ.*, Nov. 17.

4. *On the Pitch (Timbre) of the Human Voice.*—M. SECOND communicated to the French Academy of Sciences a memoir on the modifications of the pitch of the human voice. The following are the conclusions at which he arrived:—

1. The timbre is not, like the tone and intensity, a simple quality of sound, but depends always on several circumstances collectively.

2. In the vocal apparatus the modifications of the pitch result from the general state of the system, and from the action of all the parts of the vocal apparatus; but it is particularly in the vocal tube that the cause of the modifications is to be found.

3. The pharynx, the mouth, and the nasal cavities, by acting more or less apart, or by combining in action, give to a sound very various timbres. If the vocal tube has a large dimension, the sound augments in volume, and becomes grave or dull. The pitch is, on the contrary, so much the clearer or shrill, as the dimensions of the tube are smaller.

4. The clear and the deep timbre have different degrees: their production does not result from a particular form of the tube. The fixity of the larynx, generally given as characteristic of a deep note, may, to an equal degree, belong also to the clear timbre; for if one executes a roulade or shake in a low note, the larynx offers in every respect its usual mobility.

5. The timbre of the improperly called guttural note is produced whenever the glottis vibrates with a very short tube.

6. The vowels, which may be considered as so many timbres, correspond to the form and dimensions of the buccal cavity.

7. When a sound traverses the nasal cavities, it may present three principal varieties. In the first case, the mouth being shut, if the sound is driven through the nasal cavities, the latter give passage to it without being able to arrest or to retain it, and the timbre is but slightly nasal. In the second case, if the sound pursue its course through the mouth, whilst the external orifice of the nasal fossæ is closed, the timbre becomes extremely nasal if the sound be directed into the cavity of the nose, for then it is retained at every part. In the third case, if the sound be directed into the same cavity whilst the mouth and nose are both open, it will at once escape from the two; but the sound will ring in the posterior part of the nasal fossæ. In this last case, the timbre will be less nasal than in the preceding, but much more so than in the first. One sees from this, that we must carefully distinguish the sound which escapes through these cavities, and that which rings in them. It is in this distinction that we find an explanation of all the phenomena of the nasal voice.—*Lancet*, Sept. 11, 1847.

5. *Intermittent Pulse coincident with Health.*—M. BIDARD, d'Arras, gives an account of a man, above the middle stature, of the sanguine temperament, and of a strong constitution, and who had never suffered from any illness, except from inflammatory fever when about twelve years old, but the pulsation of whose heart and arteries were very abnormal. In 1826, M. Bidard was called to him on account of a contused wound of the left leg, from a kick of a horse, but which affected him very little. On that occasion, M. Bidard felt his pulso, when he noticed that after every two pulsations there was an interval of repose for nearly the length of one pulsation. There were forty-two pulsations and twenty-one periods of repose in a minute. The same condition was observed also in other arteries besides the radial. Upon listening to the heart's sounds, there were two normal and successive con-